

CLAIMS

1 1. A method of reducing a metal content of a fluorine-containing
2 elastomer through preparation thereof without using a metal compound, in
3 which a metal compound is not blended during emulsion-polymerization of a
4 fluorine-containing monomer.

1 2. A method of reducing a metal content of a fluorine-containing
2 elastomer through preparation thereof without using a metal compound, in
3 which among materials excluding a gaseous monomer for polymerization
4 which are used for polymerization of a fluorine-containing monomer,
5 coagulation and drying, at least one material contains substantially no metal
6 component.

1 3. The method of reducing a metal content of the fluorine-
2 containing elastomer of Claim 2, wherein said material is water for a
3 polymerization medium.

1 4. The method of reducing a metal content of the fluorine-
2 containing elastomer of Claim 2, wherein said material is a coagulating agent
3 for coagulation.

1 5. The method of reducing a metal content of the fluorine-
2 containing elastomer of Claim 2, wherein said material is a non-water-soluble
3 solvent which has compatibility with the fluorine-containing elastomer and is
4 added when separating water from the coagulated fluorine-containing
5 elastomer containing water.

1 6. A method of reducing a metal content of a fluorine-containing
2 elastomer through preparation thereof without using a metal compound, in
3 which emulsion polymerization of the fluorine-containing elastomer is carried
4 out while maintaining an emulsion in a weak alkaline state.

1 7. A method of reducing a metal content of a fluorine-containing
2 elastomer through preparation thereof without using a metal compound, in
3 which coagulation is carried out after an emulsified dispersion of the fluorine-
4 containing elastomer is filtrated to remove contaminants.

1 8. A method of reducing a metal content of a fluorine-containing
2 elastomer through preparation thereof without using a metal compound, in
3 which coagulation of an emulsified dispersion of the fluorine-containing
4 elastomer is carried out by using an acid containing no metal element.

1 9. A method of reducing a metal content of a fluorine-containing
2 elastomer through preparation thereof without using a metal compound, in
3 which to a fluorine-containing elastomer containing water obtained by
4 coagulation of an emulsified dispersion of the fluorine-containing elastomer is
5 added a non-water-soluble solvent having compatibility with the fluorine-
6 containing elastomer containing water to separate the water therefrom.

1 10. A method of reducing a metal content of a fluorine-containing
2 elastomer through preparation thereof without using a metal compound, in
3 which a clean gas is used for drying a fluorine-containing elastomer
4 containing water obtained by coagulation of an emulsified dispersion of the

5 fluorine-containing elastomer or, a coagulated elastomer obtained by adding,
6 to the fluorine-containing elastomer containing water, a non-water-soluble
7 solvent having compatibility therewith to separate the water therefrom.

1 11. The method of reducing a metal content of the fluorine-
2 containing elastomer of Claim 10 through preparation thereof without using a
3 metal compound, in which a vessel laminated with a fluorine-containing resin
4 film or polyethylene film on its part coming into contact with the coagulated
5 elastomer, a vessel made of a fluorine-containing resin or a vessel made of
6 polyethylene resin is used.

1 12. A method of reducing a metal content of a fluorine-containing
2 elastomer which comprises at least two of the methods of Claims 1 to 11.

1 13. A method of reducing a metal content of a fluorine-containing
2 elastomer through preparation thereof without using a metal compound, in
3 which the elastomer is prepared by using materials containing substantially no
4 metal component as all the materials used for polymerization of a fluorine-
5 containing monomer, coagulation and drying, by employing an equipment, a
6 part of which comes into contact with an emulsion, emulsified dispersion or
7 coagulated fluorine-containing elastomer containing water and is made of or
8 lined with a fluorine-containing resin or polyethylene resin, and by drying
9 with a clean gas.

1 14. A fluorine-containing elastomer having a metal content of not
2 more than 50 ppm.

1 15. A fluorine-containing elastomer having a metal content of not
2 more than 10 ppm.

1 16. A fluorine-containing elastomer having a metal content of not
2 more than 50 ppm, which is obtained by one of the methods of Claims 1 to 13
3 or by a combination of two or more thereof.

1 17. A fluorine-containing elastomer having a metal content of not
2 more than 10 ppm, which is obtained by one of the methods of Claims 1 to 13
3 or by a combination of two or more thereof.

1 18. The fluorine-containing elastomer of Claim 14, wherein the
2 elastomer comprises 40 to 90 % by mole of tetrafluoroethylene, 10 to 60 % by
3 mole of perfluorovinylether represented by the formula (1):



5 wherein R_f is a perfluoroalkyl group having 1 to 5 carbon atoms or a
6 perfluoroalkyl(poly)ether group having 3 to 12 carbon atoms and 1 to 3
7 oxygen atoms, and 0 to 5 % by mole of monomer giving a curing site.

1 19. The fluorine-containing elastomer of Claim 14, wherein the
2 elastomer comprises 30 to 90 % by mole of vinylidene fluoride, 15 to 40 % by
3 mole of hexafluoropropylene and 0 to 30 % by mole of tetrafluoroethylene.

1 20. The fluorine-containing elastomer of Claim 14, wherein the
2 elastomer comprises 10 to 90 % by mole of vinylidene fluoride, 10 to 40 % by
3 mole of perfluorovinylether represented by the formula (1)



5 wherein R_f is a perfluoroalkyl group having 1 to 5 carbon atoms or a
6 perfluoroalkyl(poly)ether group having 3 to 12 carbon atoms and 1 to 3
7 oxygen atoms, and 0 to 80 % by mole of tetrafluoroethylene.

1 21. The fluorine-containing elastomer of Claim 14, wherein the
2 elastomer is a fluorine-containing multi-segment polymer having an
3 elastomeric fluorine-containing polymer chain segment and a non-elastomeric
4 fluorine-containing polymer chain segment; said elastomeric fluorine-
5 containing polymer chain segment comprises 40 to 90 % by mole of
6 tetrafluoroethylene, 10 to 60 % by mole of perfluorovinylether represented by
7 the formula (1):



9 wherein R_f is a perfluoroalkyl group having 1 to 5 carbon atoms or a
10 perfluoroalkyl(poly)ether group having 3 to 12 carbon atoms and 1 to 3
11 oxygen atoms, and 0 to 5 % by mole of monomer giving a curing site, and said
12 non-elastomeric fluorine-containing polymer chain segment comprises 85 to
13 100 % by mole of tetrafluoroethylene and 0 to 15 % by mole of the formula
14 (2):



16 wherein R_f^1 is CF_3 or OR_f^2 , in which R_f^2 is a perfluoroalkyl group
17 having 1 to 5 carbon atoms.

1 22. The fluorine-containing elastomer of any of Claims 18 to 21,
2 wherein the elastomer contains a polymer chain having iodine and/or bromine
3 at its end and/or side chain.

1 23. The fluorine-containing elastomer of any of Claims 18 to 21,
2 wherein the elastomer has nitrile group.

1 24. A composition comprising the fluorine-containing elastomer of
2 any of Claims 14 to 23.

1 25. A molded article obtained from the composition of Claim 24.

1 26. The molded article of Claim 25 having a metal content of not
2 more than 50 ppm.

1 27. The molded article of Claim 25 having a metal content of not
2 more than 10 ppm.

1 28. The molded article of any of Claims 25 to 27, wherein the
2 article is a sealing material for semiconductor production apparatuses.

1 29. Semiconductor production apparatuses equipped with the
2 molded article of any of Claims 25 to 28.

1 30. A method of reducing a metal content of a fluorine-containing
2 polymer through preparation thereof without using a metal compound, in
3 which an equipment which is lined with a fluorine-containing resin or
4 polyethylene resin on its part coming into contact with materials for
5 polymerization and a produced polymer is used.

1 31. The method of reducing a metal content of the
2 fluorinecontaining polymer of Claim 30, wherein the equipment lined with a
3 fluorine-containing resin is a polymerizing equipment such as a
4 polymerization vessel and agitation blades and baffle plates thereof,
5 coagulation equipment, washing equipment, drying equipment or pipes
6 thereof.

1 32. The method of reducing a metal content of the fluorine-
2 containing polymer of Claim 30, wherein the fluorine-containing resin is
3 tetrafluoroethylene/perfluoro(alkyl vinyl ether) copolymer.

1 33. A method of reducing a metal content of a fluorine-containing
2 elastomer through preparation thereof by substantially reducing, from inside of
3 the fluorine-containing elastomer, a content of metal remaining after ashing, in
4 which the elastomer is prepared by using materials containing substantially no
5 metal component as all the materials used for polymerization of a fluorine-
6 containing monomer, coagulation and drying, by employing an equipment, a
7 part of which comes into contact with an emulsion, emulsified dispersion or
8 coagulated fluorine-containing elastomer containing water and is made of or
9 lined with fluorine-containing resin or polyethylene resin, and by drying with
10 a clean gas.

1 34. A method of reducing a metal content of a fluorine-containing
2 elastomer through preparation thereof by substantially reducing, from inside of
3 the fluorine-containing elastomer, a metal content remaining after ashing, in

4 which the elastomer is prepared by using materials containing substantially no
5 metal component as all the materials used for polymerization of a fluorine-
6 containing monomer, coagulation and drying, by carrying out emulsion-
7 polymerization of the fluorine-containing elastomer while maintaining an
8 emulsion in a weak alkaline state, by carrying out coagulation of an emulsified
9 dispersion of the fluorine-containing elastomer by using an acid containing no
10 metal element, and by employing an equipment, a part of which comes into
11 contact with an emulsion, emulsified dispersion or coagulated fluorine-
12 containing elastomer containing water and is made of or lined with a fluorine-
13 containing resin or polyethylene resin.

1 35. A method of reducing a metal content of a fluorine-containing
2 polymer through preparation thereof, in which an equipment which is lined
3 with a fluorine-containing resin or polyethylene resin on its part coming into
4 contact with materials for polymerization and a product polymer is used.

1 36. The method of reducing a metal content of the fluorine-
2 containing polymer of Claim 35, wherein the equipment lined with a fluorine-
3 containing resin is a polymerizing equipment such as a polymerization vessel
4 and agitation blades and baffle plates thereof, coagulation equipment, washing
5 equipment, drying equipment or pipes thereof.

1 37. The method of reducing a metal content of the fluorine-
2 containing polymer of Claim 35, wherein the fluorine-containing resin is
3 tetrafluoroethylene/perfluoro(alkyl vinyl ether) copolymer.